

Amendments to the Claims:

This listing of claims replaces, without prejudice, all prior versions and listings of claims in the application:

1. (Currently Amended). A quantitative method for very high resolution, three-dimensional combined imaging of pulmonary ventilation (V) and perfusion (Q), synchronously (V/Q), wherein the method comprises delivering a predetermined volume of hyperpolarized noble gas into the conducting airways in each ventilated region of the pulmonary system, ~~and~~ collecting local magnetic resonance image data therefrom from said hyperpolarized noble gas to produce a V/Q image data set, three-dimensionally, quantitatively imaging absolute lung perfusion (Q), and collecting local magnetic resonance image data from said perfusion imaging to produce an absolute lung perfusion image data set.

2. (Original). The method of claim 1, wherein the noble gas is hyperpolarized helium-3 gas (HP-³He).

3. (Canceled).

4. (Currently Amended). The method of claim 3 1, wherein the imaging of absolute lung perfusion (Q) comprises a gadolinium based method.

5. (Currently Amended). The method of claim 3 1, wherein the imaging of absolute lung perfusion (Q) comprises an arterial spin-tagging method.

6. (Currently Amended). The method of claim 3 1, further comprising the step of using a co-registration algorithm to spatially co-register the HP-³He MR image V/Q data set with data set Q, comprising the quantitative lung perfusion in the lung.

7. (Currently Amended). The method of claim 6, further comprising dividing the ~~lung~~ image into as many distinct voxels as imaging resolution permits.

8. (Original). The method of claim 6, further comprising computing absolute ventilation (V) by multiplying the ventilation/perfusion ratio (V/Q) by perfusion (Q) for each point in the lung image.

9. (Currently Amended). The method of claim 8, ~~wherein~~ further comprising applying the method is applied to the pulmonary system of a mammalian subject.

10. (Original). The method of claim 9, wherein the mammalian subject is human.

11. (Original). The method of claim 10, wherein the lung is normal.

12. (Original). The method of claim 10, wherein the lung is injured or diseased.

13. (Original). The very high resolution, three-dimensional images of pulmonary ventilation, produced by the method of claim 8 using hyperpolarized HP-³He gas.

14. (Canceled).

15. (Canceled).